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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/891,700	06/26/2001	Vijayakumar R. Dhuler	9134-32CT	2751

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EXAMINER

LE, DANG D

ART UNIT

PAPER NUMBER

2834

DATE MAILED: 12/05/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/891,700

Applicant(s)

Dhuler

Examiner

Dang D Le

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,6-11,35,36,40 and 42-44 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,2,6-11,35,36,40 and 42-44 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because it contains more than 150 words. Correction is required. See MPEP § 608.01(b).
2. The disclosure is objected to because of the following informalities: in the Preliminary Amendment, last line of the "In the Specification" section, insert -- , Patent No. 6,291,922. -- after "COMPONENTS".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 6-11, 35, 36, 40, and 42-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hill (6,137,206) in view of Petersen et al. (5,355,712).

Regarding claim 1, Hill shows a microelectromechanical device (Figures 9a and 9b) comprising:

- A microelectronic substrate (10);
- A thermally actuated micro actuator (120, 100, 200) disposed on said substrate; and

- At least one metallic structure (340) disposed on said substrate and spaced from said micro actuator, wherein said micro actuator is adapted to operably contact said at least one metallic structure in response to thermal actuation thereof.

Hill does not show the thermally actuated micro actuator being comprised of a single crystalline material although Hill shows the use of single crystalline material in the Information Disclosure Statement.

Petersen et al. show the actuating beams (38) being comprised of single crystalline material (column 5, lines 40-55) for the purpose of maintaining the same coefficient of expansion.

Since Hill and Petersen et al. are all from the same field of endeavor, the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to make the micro actuator with only single crystalline material as taught by Petersen et al. for the purpose discussed above.

Regarding claim 2, it is noted that Hill also show said at least one metallic structure comprising two metallic structures (330, 340).

Regarding claim 6, it is noted that Hill also shows the micro actuator (Figures 4a-4e) further comprising:

- Spaced apart supports (20, 30) disposed on said substrate;

- At least one arched beam (40) extending between said spaced apart supports;
- An actuator member (60) operably coupled to said at least one arched beam and extending outwardly therefrom; and
- Means for heating (Figures 4c-4e) said at least one arched beam to cause further arching thereof such that said actuator member moves between a first position in which said actuator member is spaced apart from said at least one metallic structure and a second position in which said actuator member operably engages said at least one metallic structure.

Regarding claim 7, it is noted that Hill also shows said micro actuator being thermally activated by internal heating thereof (Figures 4c and 4d).

Regarding claim 8, it is noted that Hill also shows said micro actuator being thermally activated by external heating thereof (Figure 4e).

Regarding claim 9, it is noted that Hill also shows said micro actuator comprising a plurality of arched beams coupled together (Figure 4b).

Regarding claim 10, it is noted that Petersen et al. also show said micro actuator being comprised of single crystal silicon.

Regarding claim 11, it is noted that Hill also shows said at least one metallic structure being comprised at least one of nickel and gold (column 11, line 47).

Regarding claim 35, Hill shows a microelectromechanical device (Figures 9a and 9b) comprising:

- A microelectronic substrate (10);

- A micro actuator (100, 120, 200) disposed on said substrate; and
- At least one metallic structure (340) disposed on said substrate adjacent said micro actuator and on substantially the same plane (on the same surface of 10), wherein said micro actuator is adapted to operably contact said at least one metallic structure in response to actuation thereof.

Hill does not show the micro actuator being comprised of a single crystalline material.

For the purpose of maintaining the same coefficient of expansion, Petersen et al. show the actuating beams (38) being comprised of single crystalline material (column 5, lines 40-55).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to make the micro actuator with only single crystalline material as taught by Petersen et al. for the purpose discussed above.

Regarding claim 36, it is noted that Hill also shows the micro actuator being at least one of a thermally actuated micro actuator and an electrostatic micro actuator.

Regarding claim 40, it is noted that Hill also shows the micro actuator further comprising:

- Spaced apart supports (20, 30) disposed on said substrate;
- At least one arched beam (40) extending between said spaced apart supports;
- An actuator member (60) operably coupled to said at least one arched beam and extending outwardly therefrom; and

- Means for heating (Figures 4c-4e) said at least one arched beam to cause further arching thereof such that said actuator member moves between a first position in which said actuator member is spaced apart from said at least one metallic structure and a second position in which said actuator member operably engages said at least one metallic structure.

Regarding claim 42, it is noted that Petersen et al. also show said micro actuator being comprised of single crystalline silicon.

Regarding claim 43, it is noted that Hill also shows said at least one metallic structure being comprised at least one of nickel and gold (column 11, line 47).

Regarding claim 44, it is noted that Hill also shows the micro actuator being configured to move between an actuated and unactuated position substantially within the plane (surface of substrate 10) of the micro actuator and the at least one metallic structure.

Information on How to Contact USPTO

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dang D Le whose telephone number is (703) 305-0156. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3431 for regular communications and (703) 305-3431 for After Final communications.

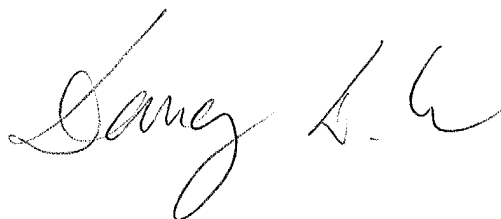
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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

DDL
November 27, 2001

A handwritten signature in cursive script, appearing to read "Larry L. H.", is positioned in the center-right of the page.